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**MSTronic**  
**MS-5012C-xx Series**  
Solar & PoE Battery Charger

# USER'S MANUAL



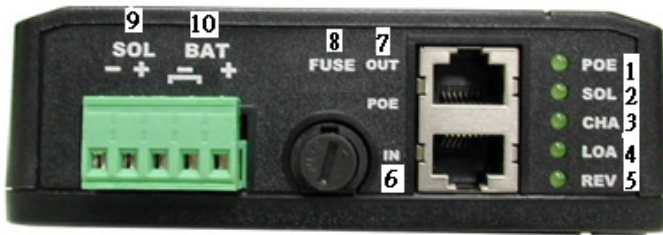
**Mstronic Co., Ltd.**

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## **Features:**

- Battery Polarity Reverse Protection
- Battery Over Charge Protection
- Battery Over Discharge Protection
- Solar Panel Polarity Reverse Protection
- Solar Panel Over Charge Protection
- Output Short Circuit Protection
- Output Over Voltage Protection
- POE Output Short Circuit Protection
- POE Output Support 802.3af Function (MS-5012C-48D)
- Two Input method:  
(1)Solar Panel (2)PoE Power source (Always Solar First.)
- Up to Three Outputs
- DIN Rail Mountable

## Panel Description:



| Item | Name         | Descriptions                                                                                                                                                                                                                                   |
|------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>POE</b> : | <u>PoE power input indicator</u> : the LED lights when the PoE input jack (the lower jack) has 18V~57V input.                                                                                                                                  |
| 2    | <b>SOL</b> : | <u>Solar power input indicator</u> : the LED lights when <b>SOL</b> terminal is connecting to a solar panel and the solar panel input voltage is over 12V.                                                                                     |
| 3    | <b>CHA</b> : | <u>Charging indicator</u> : the LED lights when <b>BAT</b> terminal is connected to battery and charging                                                                                                                                       |
| 4    | <b>LOA</b> : | <u>Loading indicator</u> : the LED lights when the rear panel output terminal is connecting to a device and offering power. The LED always on when power ready.                                                                                |
| 5    | <b>REV</b> : | <u>Battery polarity reverse indicator</u> : the LED lights when the battery polarities are reversed. (detail description see Sec. 5.1)                                                                                                         |
| 6    | <b>IN</b> :  | <u>PoE Input Jack</u> : the lower RJ45 jack, used for PoE input. Allowed input voltage 18~57V                                                                                                                                                  |
| 7    | <b>OUT</b> : | <u>PoE Output Jack</u> : the upper RJ45 jack, used for PoE output; Output voltage depends on what model you selected.                                                                                                                          |
| 8    | <b>Fuse</b>  | <u>Fuse</u> : for output over current protection, limiting the battery output current $\leq 10A$ . (If solar panel or PoE source is installed before the battery, and if the polarities of battery are reversed, then the fuse will be burnt.) |
| 9    | <b>SOL</b> : | <u>Solar Panel Terminal</u> : used to connect the solar panel.                                                                                                                                                                                 |
| 10   | <b>BAT</b> : | <u>Battery terminal</u> : used to connect the battery.<br><b>NOTE: ALWAYS CONNECT THIS TERMINAL FIRST AND DISCONNECT LAST.</b>                                                                                                                 |
| 11   | <b>LOA</b> : | <u>Load Terminal</u> : The output voltage is the same as battery voltage. Maximum voltage clamped at 12.5V.                                                                                                                                    |

## **Operation Guide**

### **NOTICE:**

1. Connect the battery to the **BAT** terminal. Make sure the polarities are correctly connected. Sequentially connect the solar panel to **SOL** terminal and connect POE source to **PoE** input (lower) jack. (If solar panel or PoE source is installed before the battery, and if the polarities of the battery be reversed, then the fuse will be burnt.)
2. Make sure the battery is properly connected to the unit. If no battery is connected, then the voltage at **BAT** terminal will be approx 13.8V
3. The solar panel cannot be used stand alone without battery connected.
4. When a solar panel and PoE input are connected to the charger, if the voltage of solar panel is higher than 15V, then solar panel is always the main power source of the charger.
5. When charge from solar panel, as the battery full and turn to floating stage, the **CHA** light will start flash.
6. When charge from PoE, as the battery full, the **CHA** light will be turn off, if the **CHA** is always flash, that means the input wattage lower than the required minimum wattage. If only charge battery, the minimum PoE input wattage is 47W, if full load, the minimum PoE input wattage is 80W.
7. When battery connect to **BAT** terminal and with valid voltage, then the **LOA** indicator will always light on even no load connected.

## **Electrical specifications**

### **1.0 INPUT**

#### 1.1 Input Source types:

- A. Solar Panel
- B. POE

#### 1.2 Input Voltage:

- A. Solar Panel: 18V~36Vmax
- B. POE: 18V~57V (47W Min. For Only Charge, 80W Min. For Full Load.)

### **2.0 OUTPUT**

| Model                           | MS-5012C-12                  | MS-5012C-18                  | MS-5012C-24                  | MS-5012C-48                  | MS-5012C-48D                 |
|---------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Output 1*<br>(at rear terminal) | 12V/1.5A<br>(as Bat. Volt.)* | 12V/1.5A<br>(as Bat. Volt.)* | 12V/1.5A<br>(as Bat. Volt.)* | 12V/1.5A<br>(as Bat. Volt.)* | 12V/1.5A<br>(as Bat. Volt.)* |
| Output 2<br>(at upper RJ45)     | 12V/1.0A<br>(as Bat. Volt.)* | 18V/1.67A<br>(regulated)     | 24V/1.25A<br>(regulated)     | 48V/0.625A<br>(regulated)    | 48V/0.35A<br>(regulated)     |

\*maximum voltage clamped at 12.5V

### **3.0 Battery Charge Types:**

- A. Solar Panel: charge current depends on the wattage of the solar panel.
- B. POE: fixed current, 2.6A max

### **4.0 Battery Types: 12V Lead Acid Battery**

### **5.0 Protection:**

#### 5.1 Battery Polarity Reverse Protection:

If only battery connected to terminal, when the battery polarities were reversed, the model will stop output and **REV** indicator light on.

When the battery be removed and re-connected to terminal, the function will be disable, if there is PoE power sources connected, when the battery polarities reversed, the fuse will be burnt.

#### 5.2 Battery Over Discharge Protection:

Cuts off the load when the battery voltage is lower than  $11V \pm 0.3V$ , and auto recover when the battery voltage returns to  $12V \pm 0.3V$

**5.3 Battery Over Charge Protection:**

Fuse control, over 10A, the fuse will be burnt.

**5.4 Solar Panel Polarity Reverse Protection:**

When solar panel polarities be reversed, the charger stop output, it won't damage the charger or end device

**5.5 Solar Panel Over Charge Protection:**

When charge current over 10A, the fuse will be burnt.

**5.6 Output Short Circuit Protection:**

When the rear output terminal or PoE output be short circuit, protection be active, the product stop output and auto-recover when the terminal back to normal connection.

**5.7 Battery Output Current Limit:**

The fuse will be burnt when battery output current over 10A

**5.8 Load Output Voltage Limit:**

The output voltage on the rear terminal normally is the same as battery, if the battery voltage higher than 12.5V, the output voltage on the terminal will be clamped at 12.5V. The PoE output of MS-5012C-12 with the same limit.

**6. GENERAL DESCRIPTION**

|                            |                      |
|----------------------------|----------------------|
| 6.1 Operation Temperature: | -20 - +60 Degree     |
| 6.2 Storage Temperature:   | -40 - +85 Degree     |
| 6.3 Operation Humidity:    | 5% - 90%             |
| 6.4 Cooling:               | Free air cooling     |
| 6.5 SIZE                   | 150*118*40mm (L*W*H) |

**7. RJ45 Connected and pin out:**

| RJ-45 Input (Data & Power) |                 |                  | RJ-45 Output (Data & Power) |                  |
|----------------------------|-----------------|------------------|-----------------------------|------------------|
| Pin                        | Symbol          | Description      | Symbol                      | Description      |
| 1                          | RX+             | Data Receive     | RX+                         | Data Receive     |
| 2                          | RX-             | Data Receive     | RX-                         | Data Receive     |
| 3                          | TX+             | Data Transmit    | TX+                         | Data Transmit    |
| 4                          | (-Vdc)_return + | Feeding power(+) | (-Vdc)_return +             | Feeding power(+) |
| 5                          | (-Vdc)_return + | Feeding power(+) | (-Vdc)_return +             | Feeding power(+) |
| 6                          | TX-             | Data Transmit    | TX-                         | Data Transmit    |
| 7                          | -Vdc            | Feeding power(-) | -Vdc                        | Feeding power(-) |
| 8                          | -Vdc            | Feeding power(-) | -Vdc                        | Feeding power(-) |